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The Relations of *Pinus edulis* and *P. monophylla*.—*Pinus monophylla*, Torr. and Frem., was described in Fremont's "Report of the Exploring Expedition to the Rocky Mountains in the Year 1842, and to Oregon and Northern California in 1843 and 4," Washington, 1845, House Doc. No. 166, p. 319. Pl. 4. The specimens upon which the description was based were obtained from "Northern California, longitude 111° to 120°"; mostly from an area now included in the State of Nevada. Among the specimens brought in by Fremont were some in which the leaves were both single and double, but the double leaves were rare exceptions to the general rule.

In the years 1857, 8 and 9, and later, I passed in many directions through most of the country occupied by *Pinus edulis* and the so-called *P. monophylla*, in the northern states of Mexico, Arizona, New Mexico, Colorado, Utah and Nevada, and I found the facts in regard to the relations of these two forms to be essentially these :

The chosen habitat and home of *Pinus edulis* is the belt or area of dry country lying between the saline and treeless portion of the "Great Basin" in Nevada and Utah and the higher and better watered mountain ranges which border or divide the desert areas.

In Southern Utah, between the summits of the Wasatch and the Western sage plains in Western New Mexico and Eastern Arizona, as well as some portions of Northern Mexico, the nut-pine attains the largest size and stands thickest on the ground. Here it ranges from 20 to 50 feet in height, has a trunk sometimes two feet in diameter and is universally two-leaved. In Nevada and Western Utah the trees are smaller in size, more scattered, and usually have but a single cylindrical leaf. Where the areas of these two varieties meet it is very common to find trees in which the foliage is about equally divided between the single and double forms. Hence it would seem that the single-leaved variety is a somewhat dwarfed and depauperate form, the effect of aridity of climate; and the single solid leaf is apparently an exhibition of the tendency so conspicuous among desert plants to reduce the ratio of surface to mass in the leaves, or the parts of the plant which perform the functions of leaves. In *Cactus*, *Holocantha*, *Canotia*, *Ephedra*, etc., we see the extreme form of this self-protective modification, no leaves but an epidermis which does what little there is for leaves to do, and in *Cactus*, *Holocantha*, etc., a formidable array of spines to protect this from possible injury. Dr. Torrey, to whom more than twenty years ago I showed my specimens of *Pinus monophylla* and *P. edulis*, agreed with me in considering them only varieties of one species. Mr. Thomas Meehan, in his interesting note lately published on this subject,* considers the two forms as of common origin, but as constituting distinct species. It seems to me, however, they are typical varieties of common origin and shading into each other, and of unusual interest, since their relationship can be easily traced, and, if I am right, the causes which have produced the differences are easily comprehensible.

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* Proc. Phila. Acad. Nat. Sciences, 1884, p. 295, and this journal.